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(54) RESOURCE MANAGEMENT METHOD AND INFORMATION SERVICE SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a video on-demand(VDD)/information on-demand(IDD) system which can assure the reception of services for subscribers even in a congestion state of a network.

SOLUTION: A session manager 13 which manages the resources has a function to reserve the sessions and services, and a subscriber can reserve a session and service. When plural clients 14 have the same or similar reservations, the manager 13 replaces these reservations with the broadcasting services which use the common resources. Thus, it's possible to effectively use the network and server resources and to offer the services to other subscribers by means of the idle resources.

[Claim(s)]

[Claim 1] The information which has the client and server by which network connection was carried out, and was demanded from the client It is the resource-management method in the information service system with which a client is provided from a server. When the connection reservation demand from each client is received, the use schedule of a network resource is managed based on the received connection reservation demand and a new connection reservation demand is published, The resource-management method which judges whether registration of the connection reservation demand is possible, and is carried out [having enabled it to guarantee connection with a server to the connection reservation demand which received and] as the feature based on the use situation of the aforementioned network resource in the time zone specified by the connection reservation demand.

[Claim 2] The information which has the client and server by which network connection was carried out, and was demanded from the client It is the resource-management method in the information service system with which a client is provided from a server. When the service reservation demand from each client is received, the use schedule of server resources is managed based on the received service reservation demand and a new service reservation demand is published, The resource-management method of having enabled it to guarantee offer of service to the service reservation demand which received, and judging whether registration of the service reservation demand being possible, and carrying out as the feature based on the use situation of the aforementioned server resources in the time zone specified by the service reservation demand.

[Claim 3] The information which has the client and server by which network connection was carried out, and was demanded from the client It is the resource-management method in the information service system with which a client is provided from a server. the service reservation demand from each client was received, and it was reserved from two or more clients – the same or an analogous service request The resource-management method characterized by replacing by one multiple address service which shares a network resource and server resources, and enabling it to process two or more service requests by which reservation was carried out [aforementioned] by multiple address service.

[Claim 4] The information service system which is equipped with the following and provides a client with the information which has the client and server which are characterized by being constituted so that connection with a server can be guaranteed to the connection reservation demand which received, and by which network connection was carried out, and was demanded from the client from a server. The network-resource management tool which manages the use schedule of a network resource based on the connection reservation demand from each client. A means to judge whether registration of the connection reservation demand is possible based on the use situation of the aforementioned network resource in the time zone specified by the connection reservation demand when a new connection reservation demand is published.

[Claim 5] The information service system which is equipped with the following and provides a client with the information which has the client and server which are

characterized by being constituted so that offer of service can be guaranteed to the service reservation demand which received, and by which network connection was carried out, and was demanded from the client from a server. A server resource-management means to manage the use schedule of server resources based on the service reservation demand from each client. A means to judge whether registration of the service reservation demand is possible based on the use situation of the aforementioned server resources in the time zone specified by the service reservation demand when a new service reservation demand is published.

[Claim 6] The information service system which provides a client with the information which has the client and server which are characterized by providing the following, and by which network connection was carried out, and was demanded from the client from a server. A service reservation receptionist means to receive the service reservation demand from each client. The same or a means to replace an analogous service request by one multiple address service which shares a network resource and server resources from two or more clients received with this service reservation receptionist means.

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] Especially this invention relates to the information service system with which the resource-management method of a network resource or server resources and this management method in VOD (video on demand) / IOD (information on demand) system are applied about the resource-management method and an information service system.

[0002]

[Description of the Prior Art] In recent years, development of the application using these is briskly performed by development of video, the digital coding technology of an audio, and wide band network technology. Especially, VOD (video on demand) / IOD (information on demand) system attracts attention as interactive service which provides a client with video or other various information from a server according to the demand from a client.

[0003] In these VOD/IOD system, resource-management functions called a session manager, such as a network, are usually used. Although, as for a session manager's function, standardization is advanced by protocol called DSM-CC (Digital Storage Media Command & Control:ISO/IEC 13818-6) to which the present standardization work is advanced, the basic function is as follows.

[0004] That is, if the session manager has managed the use situation of a network resource and the session (connection) demand from a client is received, he will investigate empty situations, such as a network resource at that time. Although a session will be set up and a server will be connected with a client if there is an opening, when there is no opening, a session is not set up but an error is notified to a client.

[0005] Usually, since the network resource is shared by two or more clients, in a crowded time zone, a session setup is not performed but the situation where service of VOD/IOD cannot be received generates a subscriber frequently.

[0006] Moreover, since the throughput is limited not only about a network resource but a server, there is a limitation in the number of services which can be offered simultaneously. Not only a network resource but when there is no opening in server resources (throughput), it becomes impossible for this reason, for a subscriber to receive service of VOD/IOD.

[0007]

[Problem(s) to be Solved by the Invention] As mentioned above, since two or more subscribers were sharing resources, such as a network, in the conventional VOD/IOD system, in the crowded time zone, the subscriber might be unable to receive service. Moreover, while a limitation has a server also in the number of services which can be offered simultaneously and service requests are occurring frequently, there is a problem that a new service request is no longer received.

[0008] As this invention was made in view of such a point and can reserve the connection to a server in advance, it aims at offering the resource-management

method which can give the guarantee which receives service to a subscriber also in the time of network rush hours, and an information service system.

[0009] Moreover, this invention is summarized considering the service to two or more subscribers' of each reservation as multiple address service, and aims at offering the resource-management method and information service system which can aim at a deployment of a network resource or server resources.

[0010]

[Means for Solving the Problem] this invention has the client and server by which network connection was carried out. It is the resource-management method in the information service system which provides a client with the information demanded from the client from a server. When the connection reservation demand from each client is received, the use schedule of a network resource is managed based on the received connection reservation demand and a new connection reservation demand is published. Based on the use situation of the aforementioned network resource in the time zone specified by the connection reservation demand, it judges whether registration of the connection reservation demand is possible, and carries out [having enabled it to guarantee the connection for communication with a server, and] as the feature to the connection reservation demand which received.

[0011] In addition to the usual network-resource function manager realized by the session manager etc., for example, the function of reservation is added in this resource-management method. This reservation function is for receiving the reservation about connection with the server by setup of a session beforehand from a subscriber, not only based on the present situation but based on the connection reservation demand from each client, the use situation of a network resource makes time a parameter, and schedule management is carried out. Thus, when a new connection reservation demand is published from a client by managing the use schedule of a network resource, it can distinguish whether registration of the connection reservation demand is possible by investigating the use situation of the network resource in the time zone specified by the connection reservation demand. Thereby, a subscriber can get the guarantee which receives service by making connection with beforehand.

[0012] Moreover, a subscriber becomes possible [reserving the service itself demanded in advance] by replacing not only with a network resource but with it, or managing the use schedule of server resources in addition to it.

[0013] Moreover, this invention has the client and server by which network connection was carried out. It is the resource-management method in the information service system which provides a client with the information demanded from the client from a server. the service reservation demand from each client was received, and it was reserved from two or more clients – the same or an analogous service request It is characterized by replacing by one multiple address service which shares a network resource and server resources, and enabling it to process two or more service requests by which reservation was carried out [aforementioned] by multiple address service.

[0014] According to this resource-management method, the same or when analogous service is reserved, those services are transposed to multiple address type service by two or more subscribers. It becomes possible for this to offer service to two or more subscribers using the same network resource and server resources. Therefore, the resources which could aim at the deployment of resources and were able to do the opening by this are utilizable because of another service provision.

[0015]

[Embodiments of the Invention] Hereafter, the operation gestalt of this invention is explained with reference to a drawing. The VOD system concerning 1 operation gestalt of this invention is shown in drawing 1. This VOD system offers information transfer service of an animation etc. interactively by sending the demand according to operation by the subscriber 15 to the VOD server 12 from a client 14 through a network 11.

[0016] A network 11 is for realizing communication of information in this VOD system, and has limited resources (bandwidth etc.). Each VOD server 12 is for offering the service demanded by the client 14. Since those resources (throughput etc.) that it has are limited, each server 12 has a limitation in the capacity to serve. For example, it is that the number of clients which can be served is specified simultaneously etc.

[0017] The session manager 13 managed the resources of a network 11, or the resources of a network 11 and each server 12, and has achieved the duty which receives the demand of the session (connection) from a client 14 or a session, and service. namely, the session manager 13 – a network 11 and a server 12 – when each resources are managed and the demand of the session / service start from a client 14 responds, resources required for them are secured and the notice of the propriety of a session / service start is returned to a client 14. Subscribers 15 are terminals, such as a set top box which carries out a direct control, and a client 14 is a device which receives service.

[0018] In this operation gestalt, the session manager 13 has further the reservation function and the multiple address service substitution function to transpose the service request from two or more clients reserved by the reservation function to multiple address service, and to process it.

[0019] (Reservation function) A reservation function is for receiving connection with the server by setup of a session, and the reservation about service beforehand from a subscriber. When a subscriber 15 does reservation of a session or service through a client 14, reservation is approved by conversation of a client 14 and the session manager 13. The session manager 13 may talk with a server 12 in the middle of this conversation. Reservation is approved when the session manager 13 judges that the session specified by each client 14 or service can be offered in the specified time zone. If reservation is approved, the detailed information on reservation will be memorized in the session manager 13, and the notice of reservation formation will be sent to a client 14.

[0020] (Multiple address service substitution function) This function is the same or the function to replace those reserved services by one common service which has

accepted conditions when reservation of analogous service is approved from two or more clients 14. Common service is multiple address type service like broadcast. As conditions, it is more than the number of reservation with fixed same contents, almost same time, and them, for example. By replacing by such multiple address type service, the server resources and the network which are occupied by the service for every client are communalized, it becomes saving of resources, it becomes possible to use for other services the resources which were able to do the opening by this, and many subscribers can receive service now.

[0021] For realization of the above reservation function and a multiple address service substitution function, the reservation receptionist processing section 131, the resource managed table 132 classified by time zone, and the reservation list 133 are prepared for the session manager 13.

[0022] The reservation receptionist processing section 131 performs the resource management using the resource managed table 132 classified by time zone, and reservation management using the reservation list 133. In the resource management using the resource managed table 132 classified by time zone, not only the use situation of the present resources but the use schedule of resources over the future is managed. This use schedule is managed considering time as a parameter based on the situation of session reservation / service reservation from each client 14. An example of the resource managed table 132 classified by time zone is shown in drawing 2 .

[0023] In drawing 2 the resource managed table 132 classified by time zone Resource managed table 132a which manages the use situation of each network resource (a resource 1, a resource 2, a resource 3, resource 4) in the time zone from time T1 to T2, Resource managed table 132b which manages the use situation of each network resource (a resource 1, a resource 2, a resource 3, resource 4) in the time zone from time T2 to T3, And it consists of resource managed table 132c which manages the use situation of each network resource (a resource 1, a resource 2, a resource 3, resource 4) in the time zone from time T3 to T4. In each [these] table, the amount of resources and the amount of empty resources are managed the usable total capacity and during use about each network resource. Here, the amount of resources is the amount of resources which a setup of the session when reservation is already approved takes during use. Thus, by managing the use schedule of a network resource and server resources by making time into a parameter, it becomes possible to investigate the empty situation of the network resource in the time zone specified by session reservation / service reservation, and server resources, and this can perform the propriety judging of reservation.

[0024] Moreover, as shown in drawing 3 , you may manage the operating condition (under use, opening) of the resources in a time zone and its time zone to each network resource (a resource 1, a resource 2, a resource 3, a resource 4, -) of every.

[0025] The resource-management table with the structure of drawing 2 or drawing 3 is similarly built not only about a network resource but about server resources. Session reservation / service reservation which carried out reservation formation is registered into the reservation list 133 of drawing 1 . An example of this reservation

list 133 is shown in drawing 4 . In a reservation list 133, the service ID for specifying the kind of service required for operation of the server ID to be used, Client ID, a session or the start time of service, a finish time, and the content of reservation which was resource-name-listed and was reserved for every reservation etc. is registered as shown in drawing 4 . It re-registers with the reservation list for the multiple addresses of drawing 5 about that a service start time, a finish time, and the content of service are the same among the reservation registered into the reservation list 133 registered into drawing 4 , or analogous reservation. The service ID for specifying the kind of service required for operation of two or more clients ID which receive the server ID to be used and multiple address service, a session and the start time of service, a finish time, and the content of reservation which was resource-name-listed and was reserved for every multiple address service etc. is registered into this reservation list for the multiple addresses.

[0026] Next, with reference to the flow chart of drawing 6 , the reservation receptionist procedure by the session manager's 13 reservation receptionist processing section 131 is explained. If a new reservation demand occurs from a client 14 (Step S11), the reservation receptionist processing section 131 will investigate [the same or] whether reservation of a similar content is already registered about time, contents, etc. with reference to a reservation list 133 (Steps S12 and S13). A same or reservation demand new when reservation of a similar content is not registered is treated as reservation which should be unprocessed, and a same or reservation demand new when reservation of a similar content is already registered is treated as reservation which should be carried out multiple address processing together with other demands (Steps S14 and S15).

[0027] Then, it is investigated when the empty state of the resources in the time zone specified by the reservation which should be unprocessed, and which should be carried out reservation or multiple address processing refers to the resource managed table 132 classified by time zone, and it is judged whether a resource required for a session setup and service provision is securable (Step S16).

[0028] When a resource required for a session setup and service provision can be secured, while the reservation is registered into a reservation list 133, when reservation formation is notified to the corresponding client 14 (Step S17), and a resource can be secured and there is nothing, it is notified to the client 14 to which the failure of reservation corresponds (Step S18).

[0029] Next, the command sequence performed to the reserved session or the start time of service is explained. First, with reference to drawing 7 , the case where a command sequence is started by the session manager 13 is explained.

[0030] If the session manager 13 becomes the reserved session or the start time of service, he will publish session establishment directions (Session Set Up Indication) to the server 12 and client 14 which correspond based on the content of reservation, respectively, and will set up a link required for communication with a server 12 and a client 14 between them. When the response (Response) to session establishment directions is not returned, issue processing of session establishment directions is retried several times. If a client 14 is connected with a server 12 by session establishment, communication will be directly performed between a client 14 and a

server 12 henceforth, and the picture transfer to a client 12 from the server 12 which answered the service request to a server 12 and its demand from the client 14 etc. will be performed.

[0031] Next, with reference to drawing 8 , operation in case a command sequence is started from a client is explained. If a client 14 becomes the reserved session or the start time of service, it will publish a session establishment demand (SessionSet Up Request) to the session manager 13. The session manager 13 publishes session establishment directions (SessionSet Up Indication) to a server 12 according to the content of reservation, and sets up a link required for communication with a server 12 and a client 14. Then, the session manager 13 notifies a session establishment state to a client 12, and makes the content of establishment check (Session Set Up Confirm). If a client 14 is connected with a server 12 by session establishment, communication will be directly performed between a client 14 and a server 12 henceforth, and the picture transfer to a client 12 from the server 12 which answered the service request to a server 12 and its demand from the client 14 etc. will be performed.

[0032] Next, with reference to drawing 9 or drawing 12 , the example of a multiple address service substitution function is explained. For example, the clients C1, C2, and C3 of drawing 1 shall carry out the next reservation, respectively.

[0033]

C months [1:1]10 21:00 - 23:00 Movie A -- Service S1 C months [2:1]10 21:10 - 23:10 Movie A -- Service S2 C months [3:1]10 21:10 - 23:10 Movie A -- When the service S3 session manager 1 manages reservation of these services, a managed table as shown in drawing 9 is used as the above-mentioned resource managed table 132. The resources which time takes the horizontal axis of drawing 9 to and service takes a vertical axis are expressed. Since there are a network resource and server resources, two or more managed tables are needed for resources.

[0034] Drawing 10 illustrates the resources use situation of a time zone that each service when service is offered as reservation is offered simultaneously. In this state, it turns out that three services S1, S2, and S3 occupy separate resources so that clearly from this drawing 10 .

[0035] Then, before service is started, the session manager 13 transposes these three services S1, S2, and S3 to one multiple address type service S4. The replaced service uses common resources. Drawing 11 is the resource managed table after being replaced. As compared with drawing 9 , occupancy resources decrease in number, the cost per one client is cut down, and it turns out that use in other services was attained in vacant resources.

[0036] Drawing 12 shows the use situation of the resources under service. It turns out that a network resource and server resources are saved as compared with drawing 10 . By replacement of such service, when change arises by the content of service, before replacing, it is necessary to take comprehension of a client. It is desirable in processing issuing guidance of service substitution to each client, and replacing only the client according to substitution etc., after it sets up the change time zone in the stage which obtains comprehension of a client or reserves service

or the session manager 13 sets up common service, before replacing, since the time of service S1 is changed in the above-mentioned example.

[0037] In addition, in the above explanation, although the VOD service system was taken for the example, the reservation function of this operation gestalt and a multiple address service substitution function are applicable not only to a picture call forwarding service but other various information service systems. Moreover, although the case where the session manager 13 also managed server resources was explained, the session manager 13 may manage only a network resource and a server 12 may manage server resources here.

[0038]

[Effect of the Invention] As explained above, according to this invention, a subscriber can get the guarantee which receives service in advance by having given the session manager the function of reservation. Moreover, while the cost per one client is cut down by transposing analogous service to multiple address type service, use becomes others possible about the same or the resources which was vacant with this, and many subscribers can receive service.

[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the VOD structure of a system concerning 1 operation gestalt of this invention.

[Drawing 2] Drawing showing the 1st example of the resource managed table used by the VOD system of this operation gestalt.

[Drawing 3] Drawing showing the 2nd example of the resource managed table used by the VOD system of this operation gestalt.

[Drawing 4] Drawing showing the 1st example of the reservation list used by the VOD system of this operation gestalt.

[Drawing 5] Drawing showing the 2nd example of the reservation list used by the VOD system of this operation gestalt.

[Drawing 6] The flow chart which shows the procedure of the reservation receptionist processing in the VOD system of this operation gestalt.

[Drawing 7] Drawing showing the 1st example of the command sequence performed at the time specified by reservation in the VOD system of this operation gestalt.

[Drawing 8] Drawing showing the 2nd example of the command sequence performed at the time specified by reservation in the VOD system of this operation gestalt.

[Drawing 9] Drawing showing typically an example of a resource managed table when some reservation is set as the VOD system of this operation gestalt.

[Drawing 10] Drawing showing typically the use situation of the resources in the VOD system of this operation gestalt.

[Drawing 11] Drawing showing change of the content of the resource managed table at the time of using the service substitution function in the VOD system of this operation gestalt.

[Drawing 12] Drawing showing typically the use situation of the resources at the time of using the service substitution function in the VOD system of this operation gestalt.

[Description of Notations]

11 — A session manager,

14 — A client,

15 — A subscriber,

131 — The reservation receptionist processing section,

132 — The resource managed table classified by time zone

133 — Reservation list.

12 — A network

13 — A server